

Appl. No. 10/587,368
Amdt dated June 23, 2008
Reply to Office action of Mar. 31, 2008

STATUS OF CLAIMS

Claims 1 – 4 are pending.

Claims 1 – 4 stand rejected.

No claims have been amended as part of this response.

REMARKS

Reconsideration of the application is respectfully requested.

Claim for Priority

The Office Action states that a certified copy of French application 04/50177 has not been received as of the mailing date of the instant Office Action. In response, Applicants note that the present application is the national stage application under 35 U.S.C. § 371 of the International Application No. PCT/FR2005/050055, as indicated by the Preliminary Amendment received by the Office on July 26, 2006, accompanied by the First Page of PCT Publication No. WO 2005/078166. According to Article 17.2 of the PCT regulations, and as explained in MPEP § 1893.03(c)(II), Applicants have fulfilled the requirement of providing the certified copy of the French priority application by providing the said copy to the International Bureau. The Examiner is kindly requested to request the International Bureau to furnish a copy of the certified priority document. Acknowledgement of the receipt of said certified copy from the International Bureau is kindly requested.

Amendment to the Specification

The Claim For Priority section of the Specification has been amended to clarify that the present application is the national stage application under 35 U.S.C. § 371 of the International Application No. PCT/FR2005/050055 filed January 28, 2005. No new matter has been added by this amendment.

Claim Rejections – 35 U.S.C. § 103

Claims 1 – 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ozawa (Japanese Publication No. 06234590)¹. Applicants respectfully disagree with and traverse these rejections for at least the following reasons.

35 U.S.C. § 103(a), states in pertinent part,

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Attention is kindly drawn to MPEP 2142 which states that the Examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. MPEP 2142 further admonishes that to reach a proper determination under 35 U.S.C. § 103, the examiner must step backward in the time and into the shoes of worn by the hypothetical “person of ordinary skill in the art” when the invention was unknown and just before it was made. The Supreme Court has stated that “[t]he key

¹ Referred to as “European Application No. 05044681 (Ozawa)” in the Office Action

to supporting any rejection under 35 U.S.C. § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. *KSR Intl Co. v. Teleflex Inc.*, 82 USPQ2d 1385, 1396 (2007). The Federal Circuit has reiterated that "rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

A. Lack of *Prima Facie* Case of Obviousness for Independent Claim 1

Claim 1 recites:

1. A device for manufacturing a single-crystal solid phase by solidification of a liquid phase, comprising:

a crucible capable of containing the solid phase and the liquid phase, the liquid phase being in contact with the crucible and the solid phase being separated from the crucible by an interstice; and

means for heating the liquid phase capable of creating a thermal gradient at the level of an interface between the liquid phase and the solid phase,

electromagnetic field generation means, distinct from the heating means, for applying an electromagnetic pressure on the junction surface of the liquid phase at the level of said interface comprising at least one spiral surrounding the crucible, and placed opposite to the area in which said interface forms in operation.

To establish a *prima facie* case of obviousness, the Examiner is required to articulate a finding that the prior art included each element claimed. MPEP 2143(A) (emphasis added). Applicants respectfully submit that none of the limitations recited in Claim 1 are disclosed or fairly suggested by the cited art of record, as set forth

below, and thus no *prima facie* case of obviousness has been established for independent Claim 1.

Claim 1 recites, in relevant part, "a crucible capable of containing the solid phase and the liquid phase, the liquid phase being in contact with the crucible and the solid phase being separated from the crucible by an interstice." (emphasis added). In contrast to the claimed invention, in Ozawa, the liquid phase "is made away from the inner wall surface of the vertical vessel 5 by the electromagnetic repulsive force between the molten liquid 3 and the conductive member 12 given electromagnetic induction." (emphasis added) See Abstract of Ozawa and associated Figure. The solid phase, on the other hand, is in contact with the crucible, and not separated by an interstice, as admitted by the Examiner. Accordingly, Ozawa fails to teach at least the aforementioned features of Claim 1. Reconsideration and removal of this 35 U.S.C. § 103(a) rejection is respectfully requested.

Furthermore, with regard to the solid phase, the Examiner admits on Page 2 of the Office Action that Ozawa does not teach an interstice between the solid phase and the crucible, but then contends that "in the absence of unobvious results, it would have been obvious to one of ordinary skill in the art to modify and optimize the process and apparatus limitation in order to ensure proper orientation. The motivation being to prevent contact solidification through the cooling of the molten liquid with the vessel and producing high quality, high yielding single crystals." The alleged motivation articulated by the Examiner is deficient for at least the reason that

to prevent contact solidification through the cooling of the molten liquid, one would be motivated to keep the liquid phase away from the crucible and not the solid phase. This is, in fact, what Ozawa teaches. However, Claim 1 recites that the liquid phase is in contact with the crucible, whereas the solid phase is separated from the crucible. Ozawa's teaching is thus inverse to the Applicants' claimed invention of having the liquid phase in contact with the crucible wall and the solid phase separated from the crucible, as Ozawa teaches the liquid phase be kept away from the crucible and the solid phase in contact with the crucible. For this additional reason, reconsideration and removal of this 35 U.S.C. § 103(a) rejection of Claim 1 is respectfully requested.

The above notwithstanding, Claim 1 further recites "electromagnetic field generation means, distinct from the heating means, for applying an electromagnetic pressure on the junction surface of the liquid phase at the level of said interface comprising at least one spiral surrounding the crucible, and placed opposite to the area in which said interface forms in operation." As an initial matter, Applicants note that the electromagnetic field generation means is distinct from the heating means. Second, the electromagnetic field generation means is for applying an electromagnetic pressure on the junction surface of the liquid phase at the level of the interface between the liquid phase and the solid phase. Third, the electromagnetic field generation means includes at least one spiral surrounding the crucible and is placed opposite to the area in which the interface forms in operation.

In contrast to the claimed invention, Ozawa teaches a high-frequency induction coil (13) around the side of a conductive member 12, which member is provided around the side of a vertical vessel (5). See Abstract of Ozawa and associated Figure. The induction coil (13) is for high-frequency induction heating for both, melting and heating the semiconductor material. Hence, coil (13) operates as the heating element. Claim 1, in contrast, recites an electromagnetic field generator means which is distinct from the heating means. Ozawa is silent as to providing an electromagnetic field generator means distinct from the heating means. Thus, the cited reference fails to teach or suggest an electromagnetic field generator which surrounds the crucible and is placed in area opposite to the area wherein the interface between the liquid phase and the solid phase forms during the operation. For this additional reason, the present rejection fails to meet the requirements of 35 U.S.C. § 103(a). Accordingly, reconsideration and removal of this 35 U.S.C. § 103(a) rejection is respectfully requested.

Dependent claim 2 depends from patentably distinct Claim 1. At least by virtue of its dependence, and in light of the reasons set forth above with respect to Claim 1 above, reconsideration and removal of this 35 U.S.C. § 103(a) rejection of Claim 2 is respectfully requested.

Independent method Claim 3 recites features similar to those recite in independent apparatus Claim 1. For at least the reasons set forth above with regard to Claim 1, Claim 3 is also patentably distinct. Accordingly, reconsideration and removal of this 35 U.S.C. § 103(a) rejection is respectfully requested.

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Dependent claim 4 depends from patentably distinct Claim 3. At least by virtue of its dependence, and in light of the reasons set forth above with respect to Claims 1 and 3 above, reconsideration and removal of this 35 U.S.C. § 103(a) rejection of Claim 4 is respectfully requested.

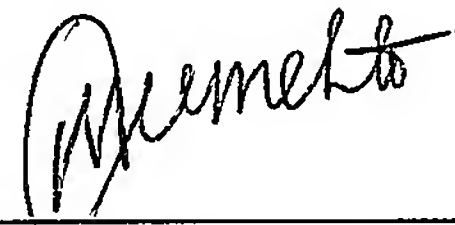
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CONCLUSION

Having addressed all outstanding grounds raised by the Examiner, Applicants respectfully submit the present case is in condition for allowance, early notification of which is earnestly solicited.

Should there be any questions or outstanding matters, the Examiner is cordially invited and requested to contact Applicants' undersigned attorney at his number listed below.

Respectfully submitted,



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